Log Event A

Borehole # 20-10-02

Borehole Information

Farm : B	**Tank :** B-110	**Site Number :** 299-E33-213
N-Coord : 45,257	**W-Coord :** 52,815	**TOC Elevation :** 654.02
Water Level, ft :	**Date Drilled :** 8/31/1973	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:

Borehole 20-10-02 was drilled in August 1973 to a depth of 100 ft and was completed with 6-in. casing. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. These references do not indicate that the borehole casing was perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 2B	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 11/97	**Calibration Reference :** GJO-HAN-20	**Logging Procedure :** MAC-VZCP 1.7.10-1

Logging Information

Log Run Number : 1	**Log Run Date :** 10/27/1998	**Logging Engineer:** Alan Pearson
Start Depth, ft.: 98.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 0.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Logging Operation Notes:

This borehole was logged by the SGLS in a single log run. The top of the borehole casing, which is the zero reference for the SGLS, is approximately flush with the ground surface. The total logging depth achieved was 98.0 ft.

Analysis Information

Analyst : E. Larsen

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 03/12/1999

Analysis Notes :

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for a 0.280-in.-thick steel casing was applied to the concentration data during the analysis process.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Two plots of the shape factor analysis results are included. The plots are used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole.

Plots of the historical gross gamma log data from 1975 to 1994 are presented with the SGLS log plots. The log-plot sequence can be used to help identify any historical changes in gross gamma activity. Also included is a time-series plot that compares the decay rate of the historical gross gamma data with the calculated decay curves for specific radionuclides.

Results/Interpretations:

The man-made radionuclides Cs-137 and Co-60 were detected around this borehole. The Cs-137 contamination was measured continuously from the ground surface to 18 ft and nearly continuously from 20.5 to 43 ft. A deeper zone of nearly continuous Cs-137 contamination was detected from 88.5 ft to the bottom of the logged interval (97.5 ft). A single occurrence of Cs-137 was detected at 68 ft. The Co-60 contamination was measured continuously from 67 to 73.5 ft. A single occurrence of Co-60 was detected at 79.5 ft.

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The total gamma plot indicates elevated count rates between 70 and 85 ft. This elevated count rate is the result of Sr-90 contamination.

The K-40 concentrations increase from 38.5 to 43 ft. Several U-238 concentrations are absent between 75.5 and 81 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks B-107 and B-110.